NEWPORT

MP MASTER

MA23751

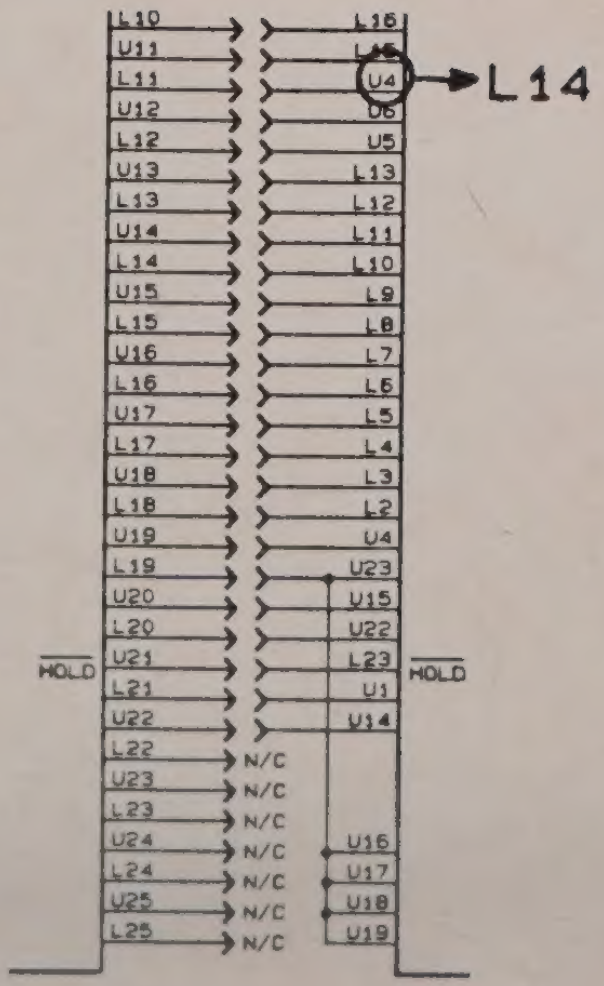
OWNERS MANUAL

P6000 OUTPUT OPTIONS
ISOLATED PARALLEL BCD
DUAL 8A RELAY

10627ML-01

The following reflects corrections since last printing of the P6000 options manual.

Pg./Section	Current	Change to
2 / 3.2	U20 N/C (N/C)	U20 POLARITY (GO ALARM)
11 / 1.0	TB4, a mating ...	TB4J, a mating ...
7 / 5.2	——————→	



CHG	EO NO	DATE	BY	CHK
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OWNER'S MANUAL

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1.0 GENERAL

The optional parallel BCD board works concurrently in two output modes: 6-digit parallel BCD (24 lines) and addressable 3-digit. In addition to the 6-digit BCD, this board outputs the alarm condition (High, Low and Go), polarity, overflow and decimal point binary address signals. The outputs are three-state and electrically isolated from the main board. They are active when the appropriate address is applied on connector P4, pins L24, U24, L23 and U23. The inputs are internally connected to the main board via the interconnection of P5 with J5.

Outputs are available on P4, a 50-pin dual-row header at the rear of the board. The P4 mates with a standard, 50-pin mass-terminated connector. The P4 outputs can be frozen by taking the $\overline{\text{HOLD}}$ input (P4-U21) low. Although the BCD outputs are always valid, the $\overline{\text{DATA READY}}$ signal goes active low for approximately 0.2 millisecond when BCD data is updated.

2.0 MECHANICAL INSTALLATION

The parallel BCD board is positioned as an upper board in the P6000. Refer to the exploded view in the main board manual.

To install:

1. Hold the board upside-down with components facing the main board.
2. Position the P5 pins to mate with the J5 connector on the power supply board.
3. Push the board downward until it rests on the upper rear panel and display board.

3.0 ELECTRICAL CONNECTIONS

NOTE: The software switch SS3 of Configuration 2 must be set (XXX1XX) to activate the parallel BCD board. For more information, refer to Section 3.9 of the P6000 main board manual.

3.1 POWER

An isolated +5V ±10% external power supply is required and should be connected to pin P4-L21 (+5V) and pin P4-L19 (ISO GND). If isolation is not required, S5A, S5B, S6A and S6B can be installed to power the parallel BCD option by the main board.

3.2 BCD OUTPUTS

The board is factory-set as 6-digit parallel BCD and is pin-compatible with Newport's Model 320 bus controller. Outputs are enabled when the binary address on the instrument select lines, pins L24, U24, L23 and U23, match the board address (set by pin group S1). The output polarity is normally positive true (reversable by S4) and each output can drive 10 LSTTL loads.

(N/C)	ALARM LOW	L1	U1	ALARM HIGH (N/C)
(N/C)	N/C	2	2	ALARM GO (N/C)
(N/C)	N/C	3	3	N/C (N/C)
(N/C)	N/C	4	4	N/C (N/C)
(N/C)	BCD 400 k	5	5	BCD 800 k (N/C)
(N/C)	BCD 100 k	6	6	BCD 200 k (N/C)
(ISO GND)	ISO GND	7	7	N/C (N/C)
(N/C)	BCD 40 k	8	8	BCD 80 k (N/C)
(N/C)	BCD 10 k	9	9	BCD 20 k (N/C)
(N/C)	BCD 4 k	10	10	BCD 8 k (N/C)
(N/C)	BCD 1 k	11	11	BCD 2 k (N/C)
(ALARM HIGH)	D.P. 2	12	12	D.P. 4 (ALARM LOW)
(BCD 400 k)	BCD 400	13	13	BCD 800 (BCD 800 k)
(BCD 100 k)	BCD 100	14	14	BCD 200 (BCD 200 k)
(BCD 40 k)	BCD 40	15	15	BCD 80 (BCD 80 k)
(BCD 10 k)	BCD 10	16	16	BCD 20 (BCD 20 k)
(BCD 4 k)	BCD 4	17	17	BCD 8 (BCD 8 k)
(BCD 1 k)	BCD 1	18	18	BCD 2 (BCD 2 k)
(ISO GND)	ISO GND	19	19	D.P. 1 (OVERFLOW)
($\overline{\text{DATA READY}}$)	$\overline{\text{DATA READY}}$	20	20	N/C (N/C)
* ISO V+, 4.5 TO 5.5 V		21	21	* $\overline{\text{HOLD}}$ ($\overline{\text{HOLD}}$)
(N/C)	N/C	22	22	OVERFLOW (N/C)
* BOARD ADDR $\overline{\text{B4}}$		23	23	* BOARD ADDR $\overline{\text{B8}}$
*(BCD 1-800 ENABLE)	BD ADDR $\overline{\text{B1}}$	24	24	* BD ADDR $\overline{\text{B2}}$ (BCD 1-800 k ENABLE)
(N/C)	N/C	L25	U25	N/C (N/C)

( ) Output in addressable 3-digit at a time mode
* An input
N/C No internal connection

To enable the outputs, install jumpers on the pin groups and apply the proper address on the instrument select lines as indicated below:

6-Digit Parallel BCD	S1 Positions	Connector P4 with Instrument Select Lines U23	L23	U24	L24
Install a jumper on position A of pin-groups S2 and S3. U5A and U6A on XU5A and XU6A sockets.	B8, B4, B2, $\overline{B1}$	0	0	0	0
	B8, B4, B2, $\overline{B1}$	0	0	0	1
	B8, B4, $\overline{B2}$, B1	0	0	1	0
	B8, B4, $\overline{B2}$, $\overline{B1}$	0	0	1	1
	B8, $\overline{B4}$, B2, B1	0	1	0	0
	B8, $\overline{B4}$, B2, $\overline{B1}$	0	1	0	1
	B8, B4, $\overline{B2}$, B1	0	1	1	0
	B8, $\overline{B4}$, $\overline{B2}$, $\overline{B1}$	0	1	1	1
	$\overline{B8}$, B4, B2, B1	1	0	0	0
	$\overline{B8}$, B4, B2, $\overline{B1}$	1	0	0	1
	$\overline{B8}$, B4, $\overline{B2}$, B1	1	0	1	0
	$\overline{B8}$, B4, $\overline{B2}$, $\overline{B1}$	1	0	1	1
	$\overline{B8}$, $\overline{B4}$, B2, B1	1	1	0	0
	$\overline{B8}$, $\overline{B4}$, B2, $\overline{B1}$	1	1	0	1
	$\overline{B8}$, $\overline{B4}$, $\overline{B2}$, B1	1	1	1	0
	$\overline{B8}$, $\overline{B4}$, $\overline{B2}$, $\overline{B1}$	1	1	1	1

Addressable 3-Digit Parallel BCD	S1 Positions	Connector P4 with Instrument Select Lines U23 L23 U24 L24	
		ENABLES BCD 1 - 800 OVRFLW, HI,LO,GO	ENABLES BCD 1k - 800k D.P. 1,2,4, POL
Install a jumper on position B of pin-groups S2 and S3. U5A and U6A on U5B and U6B sockets.	X, X, B2, B1	X, X, X, 0	X, X, 0, 1
	X, X, B2, $\overline{B1}$	X, X, X, 1	X, X, 0, 0
	X, X, $\overline{B2}$, B1	X, X, X, 0	X, X, 1, 1
	X, X, $\overline{B2}$, $\overline{B1}$	X, X, X, 1	X, X, 1, 0

0 = Open or TTL High level (more than 2.0 V)
1 = Ground or TTL Low level (less than .8 V)
X = Don't Care

Table 3-1 Required Address to Enable Outputs

3.3 POLARITY OUTPUT

This three-state output is active when Digits 1, 2 and 3 are enabled. Signal polarity can be reversed by a push-on jumper at S4. With a jumper on S4-A, a high level corresponds to a positive display value.

3.4 DECIMAL POINT BINARY ADDRESS (D.P. 1, 2 AND 4)

These three-state outputs are enabled with Digits 1, 2 and 3. Signal polarity can be reversed by a push-on jumper at S4. With a jumper on S4-A, the outputs represent positive true binary address of a right-hand decimal point (see Table 3-2).

Decimal Point Position	D.P. 4	D.P. 2	D.P. 1
FFFFFF.	0	0	1
FFFFF.F	0	1	0
FFFF.FF	0	1	1
FFF.FFF	1	0	0
FF.FFFF	1	0	1
F.FFFFF	1	1	0

Table 3-2 Decimal Point Binary Address

3.5 OVERFLOW OUTPUT

This three-state output is active when Digits 4, 5 and 6 are enabled. S4 reverses the polarity. When a jumper is installed on S4-A, an overflow condition makes this output go high. In this case, all of the digits of the parallel BCD board represent a "9" (BCD 1001). The decimal point address corresponds to the point selected as Fixed Range decimal point. S7 connects this output to pin U22 of the P4 connector.

3.6 ALARM OUTPUTS (HI, LO, GO)

These three-state outputs are enabled with Digits 4, 5 and 6. S8, S9 and S10 connect HI, LO and GO to P4-U1, L1 and U2, respectively. The polarity is positive true (high level corresponds to an alarm condition) when a jumper is installed on S4-A.

3.7 $\overline{\text{DATA READY}}$ OUTPUT

The output is always valid because the parallel BCD data updates synchronously with a single clock pulse. A negative true $\overline{\text{DATA READY}}$ signal goes high, however, for about 0.2 milliseconds when the parallel BCD data is updated.

3.8 INSTRUMENT SELECT INPUTS (P4-U23, L23, U24 AND L24)

These are TTL-compatible inputs with 47 kOhms pull-up resistors. When the input logic levels match the instrument address (set by S1), the outputs are enabled. When the logic levels do not match, they are in high impedance. Refer to Table 3-1.

3.9 $\overline{\text{HOLD}}$ INPUT

When low, this input freezes the outputs and makes the $\overline{\text{DATA READY}}$ low true. The internal BCD data continues to update. The updated data replaces the outputs when HOLD goes high. *

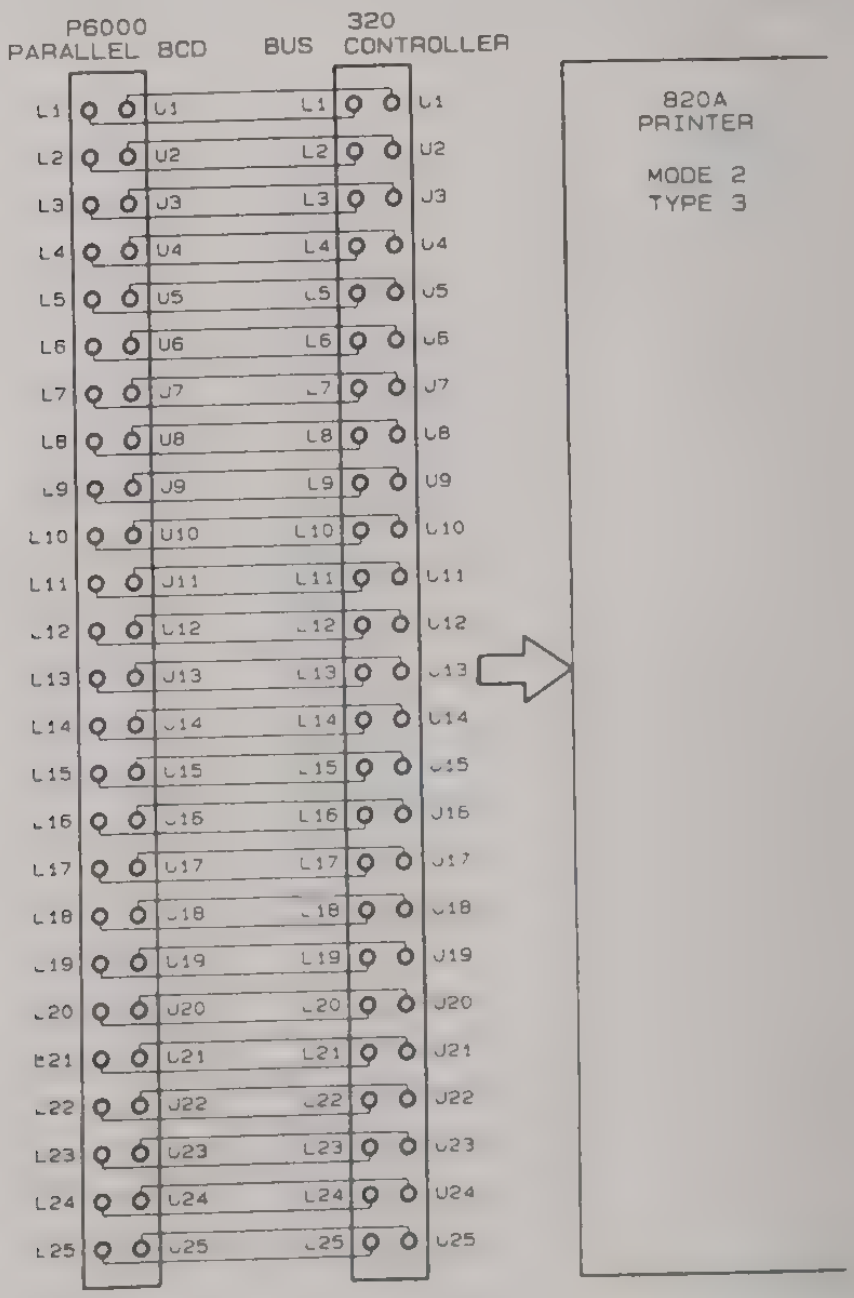
4.0 JUMPER SELECTION

Pin Group	Function
S1	Selects the binary address (Table 3-1).
S2	Jumper installed on A: Board can be selected by four address lines on connector P4, pins U24, L24, U23 and L23. Jumper installed on B: U24 signal selects the board. Polarity is selectable by S1-B1.
S3	Controls the $\overline{\text{DATA READY}}$ output. Jumper installed on A: $\overline{\text{DATA READY}}$ is active low when the input address matches the board address. Jumper installed on B: $\overline{\text{DATA READY}}$ is active when P4-U24 matches S1-B1 or P4-L24 matches S1-B2.
S4	Inverts all output logics except $\overline{\text{DATA READY}}$. S4-A corresponds to positive true logic.
S5, S6	Jumpers installed on A and B of S5 and S6: The main board powers the parallel BCD board. The outputs are not isolated from the main board.
S7, S8, S9, S10	Connects Overflow, High, Low and Go signals to connector P4, pins U22, U1, L1 and U2, respectively.

* If the $\overline{\text{HOLD}}$ input goes high during transmission, the output update is postponed in order to prevent erroneous output. Each transmission requires approximately 10 milliseconds.

5.0 APPLICATION HINTS AND WIRING

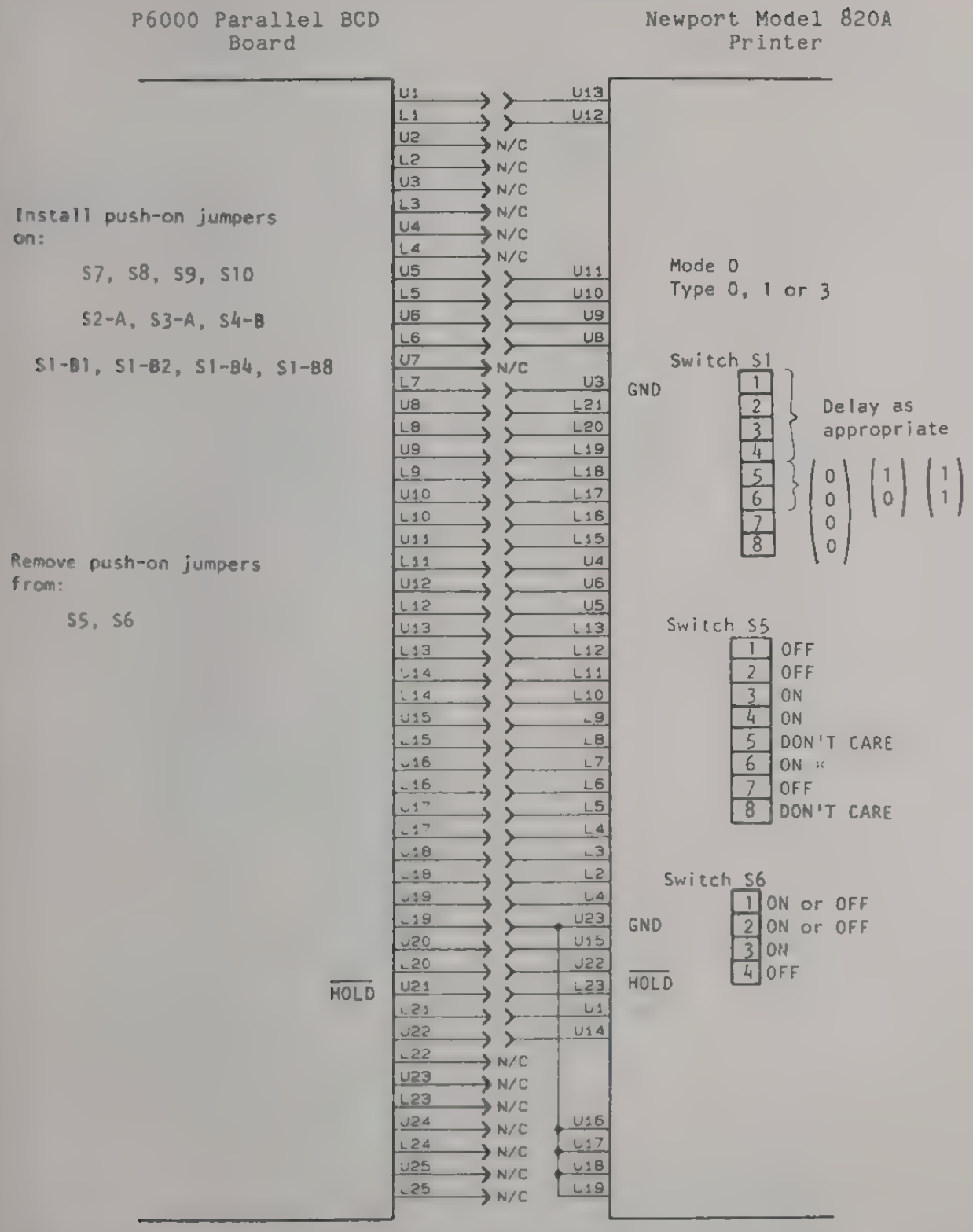
5.1 INTERCONNECTION WITH A MODEL 320 PARALLEL BCD BUS CONTROLLER



The pins on the Parallel BCD board should be wired to the identical numbered pins on the 320 Controller.

NOTE: The decimal point position is fixed and configured on the board.

5.2 INTERCONNECTION WITH A NEWPORT 820A PRINTER



* If one print per measurement is desired, switch S5-6 (on the printer) to OFF and disconnect HOLD. S1-1 through S1-4 should be OFF.

5.3 INTERFACE WITH PROGRAMMABLE CONTROLLERS

If the controller can accept 24 bits of BCD data (32 bits if other data is also required), the 6-digit parallel BCD mode can be used.

In addressable 3-digit at a time mode, only half of the I/O lines are required. In this mode, Digits 4, 5 and 6, Overflow, High, Low and Go signals can be accessed on the same lines of Digits 1, 2 and 3, D.P. 1, D.P.2, D.P. 4 and Polarity signals. Parallel BCD board can be configured as an addressable 3-digit at a time BCD as follows:

a. Move U5A and U5B integrated circuits (IC) to U5B and U6B sockets.

b. Install a jumper on S2-B and S3-B.

The outputs can be enabled by an appropriate logic level on U24 and L24 pins of P4 (see Table 3-1).

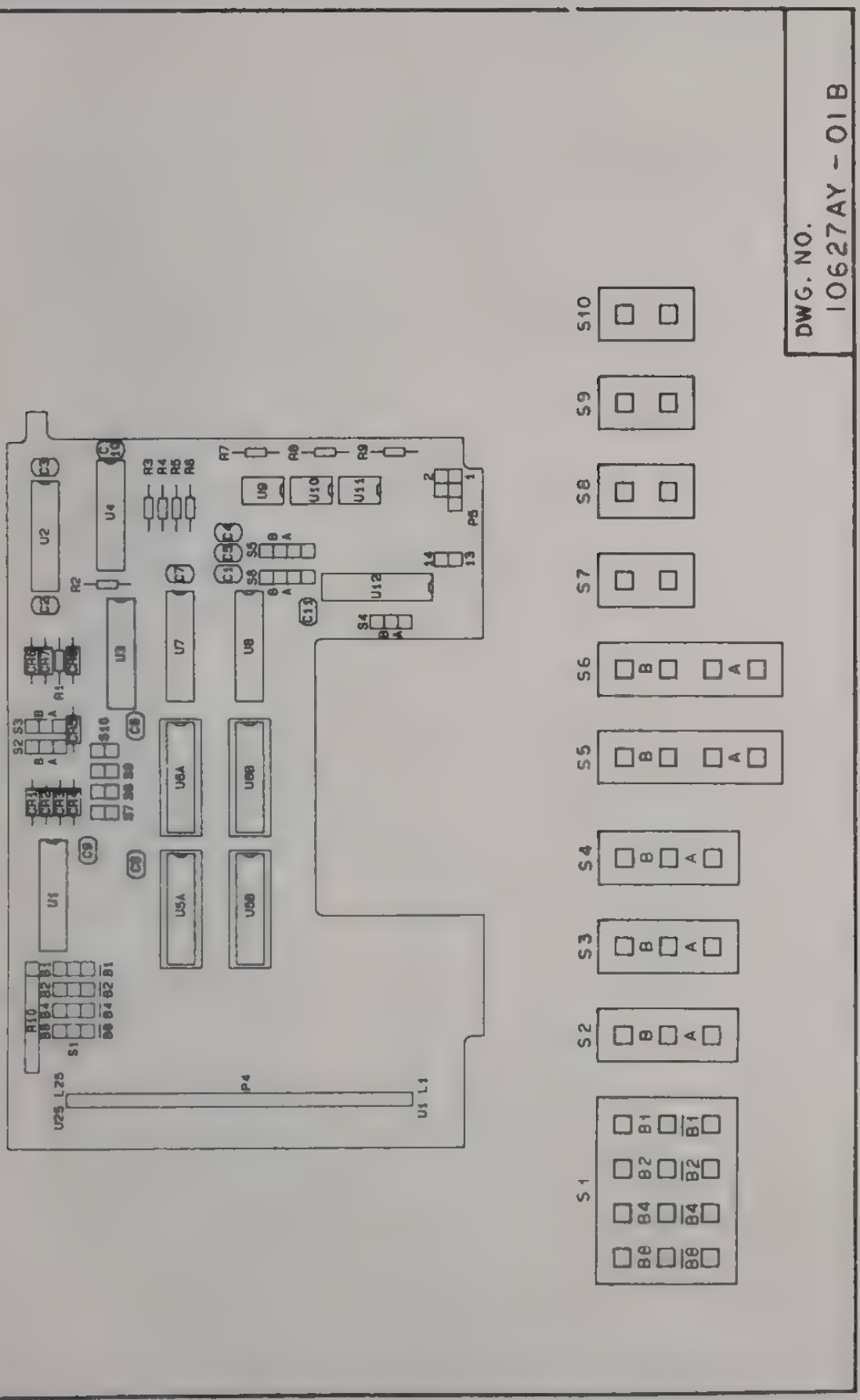


Figure 6-1 Parallel BCD Board Assembly Diagram

Figure 6-2 Parallel BCD Board Schematic Diagram

1.0 GENERAL

The relay option provides two Form-C relays corresponding with LO and HI setpoints of the P6000. The inputs are internally connected and the outputs are available on TB4, a 6-position barrier. TB4, a mating screw-clamp connector, is standard.

2.0 MECHANICAL INSTALLATION

The relay board is positioned as an upper board in the P6000. Refer to the exploded view in the main board manual.

To install:

1. Hold the relay board upside-down with components facing the main board.
2. Position the P5 pins to mate with the J5 connector on the power supply board.
3. Push the board downward until it rests on the upper rear panel and display board.

3.0 ELECTRICAL CONNECTION AND JUMPER SELECTION

3.1 RELAY OUTPUTS

The relay outputs are available on the TB4 connector (Figure 3-1). The relay board is rated for 8 A current with resistive and 3 A with inductive loads. Push on jumpers must be installed on pin groups [illegible] (Figure 3-2) when the P6000 is powered by an external battery connected to V+) with a voltage higher than 9 volts.

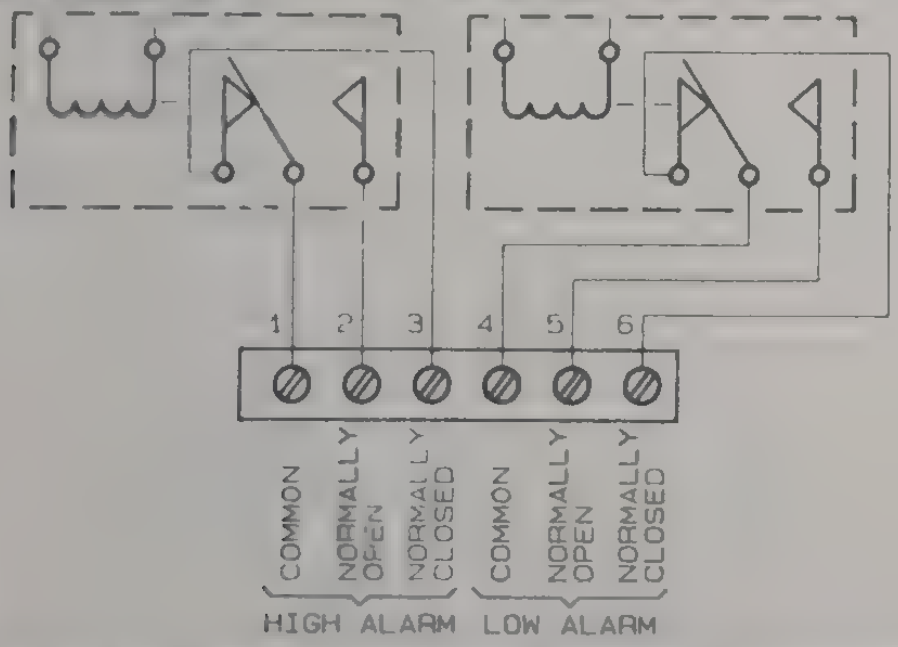


Figure 3-1 TB4 Connector with Electrical Connections

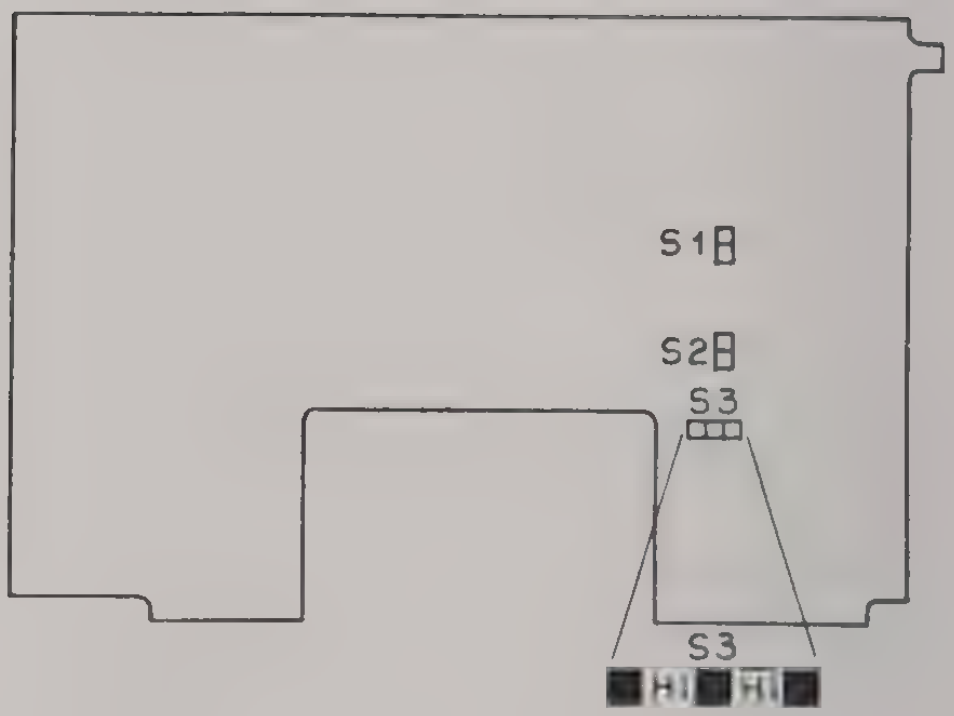


Figure 3-2 Relay Board Pin Groups

3.2 S3 OF THE RELAY BOARD

If a jumper is installed on the HI position, high relay is **energized when high alarm is active.**

If a jumper is installed on HI, the relay is energized when high alarm is not active (LO or OO active). Also, with the jumper on HI, the high setpoint should be higher than the low setpoint.

NOTE: Refer to the P6000 main board owner's manual for low alarm **polarity reversal.**

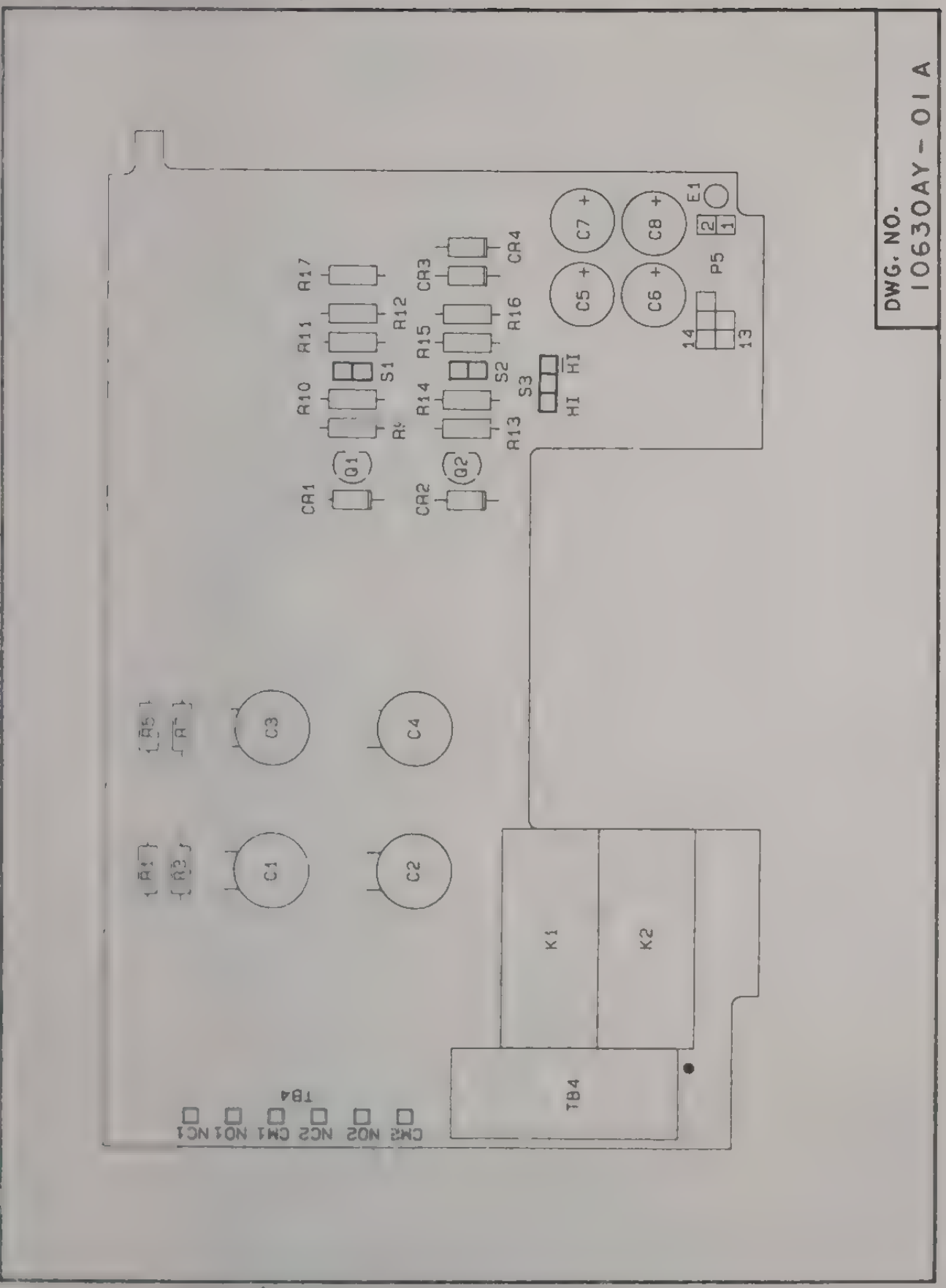


Figure 4-1 Relay Board Assembly Diagram

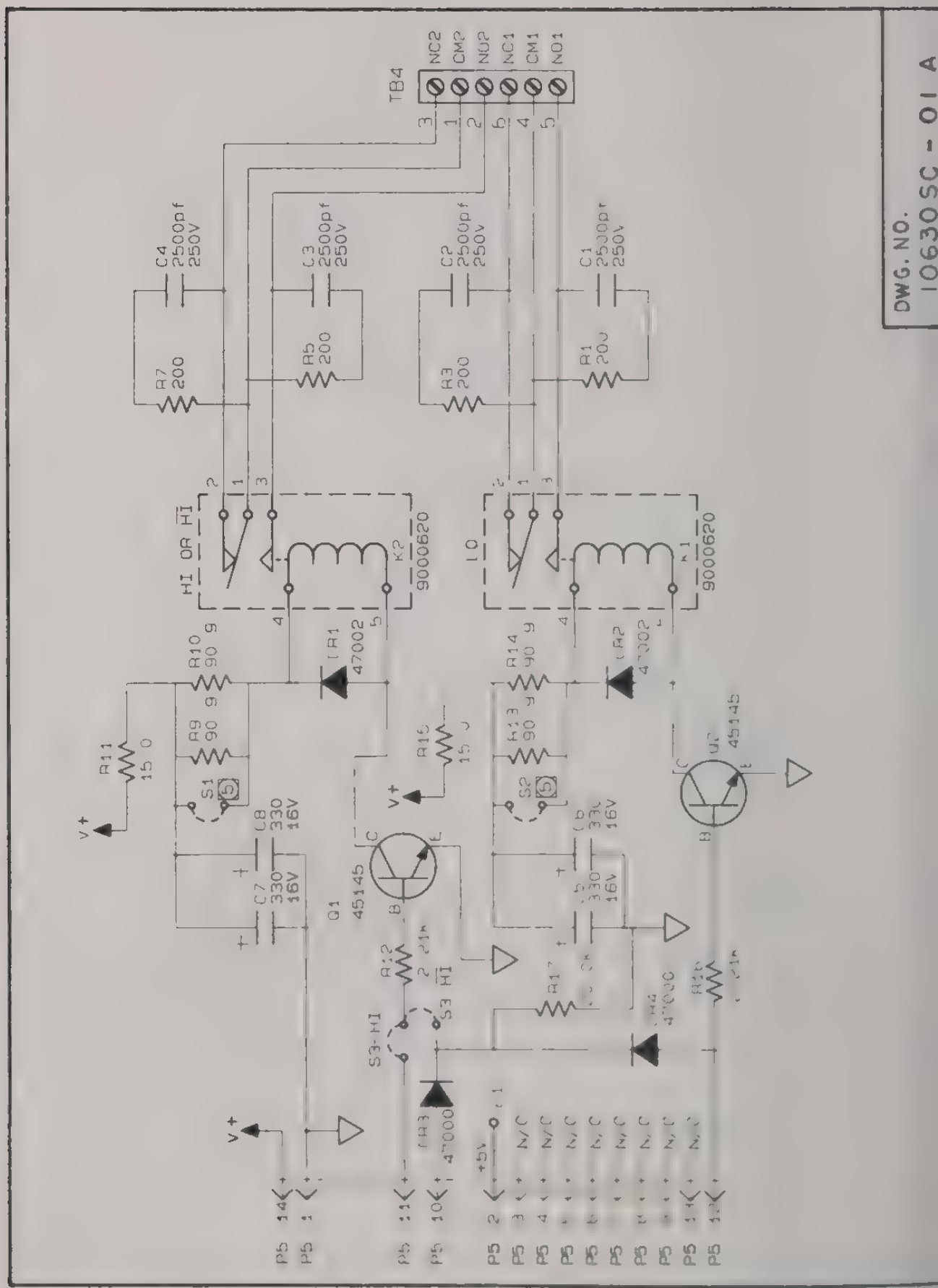


Figure 4-2 Relay Board Schematic Diagram

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